

Docket No.: 241786US2SRD

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
WU MEI, ET AL. : EXAMINER: LEE, C.  
SERIAL NO.: 10/643,974 :  
FILED: AUGUST 20, 2003 : GROUP ART UNIT: 1795  
FOR: FUEL CELL CATALYST  
MATERIAL, FUEL CELL ELECTRODE,  
MEMBRANE-ELECTRODE ASSEMBLY,  
FUEL CELL, FUEL CELL CATALYST  
MATERIAL MANUFACTURING  
METHOD, AND FUEL CELL  
ELECTRODE MANUFACTURING  
METHOD

DECLARATION UNDER 37 C.F.R. §1.132

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Now comes Wu MEI, who deposes and states:

1. I am one of the inventors in the above-identified application.
2. Materials A to C were manufactured by the following methods.

<Manufacture of Material A>

A mixture of Pt and Fe was molten in an Ar flow. The molten mixture was solidified using twin-roll method to produce solid solution. The circumferential velocity of the rolls was set at 30 m/s. Subsequently, the solid solution

thus obtained was subjected to heat treatment in N<sub>2</sub> atmosphere at 900°C for 24 hours to nitride the solid solution. A catalyst material containing Pt and Fe was thus obtained. Hereinafter, the catalyst material is referred to as "Material A".

<Manufacture of Material B>

A mixture of Pt and Fe was molten in an Ar flow. The molten mixture was solidified using pseudo-zero gravity solidification method to produce solid solution. In the pseudo-zero gravity solidification method, the rate of temperature decrease was set at 1,250°C/s. Subsequently, the solid solution thus obtained was subjected to heat treatment in N<sub>2</sub> atmosphere at 900°C for 24 hours to nitride the solid solution. A catalyst material containing Pt and Fe was thus obtained. Hereinafter, the catalyst material is referred to as "Material B".

<Manufacture of Material C>

A mixture of Pt and Fe was molten in an Ar flow. The molten mixture was solidified using Atomization method to produce solid solution. Subsequently, the solid solution thus obtained was subjected to heat treatment in N<sub>2</sub> atmosphere at 900°C for 24 hours to nitride the solid solution. A catalyst material containing Pt and Fe was thus obtained. Hereinafter, the catalyst material is referred to as "Material C".

TABLE I below shows the conditions for manufacturing Materials A to C.

TABLE I

| Material              | A                | B   | C                  |
|-----------------------|------------------|---|--------------------|
| Raw material          | Pt, Fe           | Pt, Fe                                    | Pt, Fe             |
| Solidification method | Twin-roll method | Pseudo-zero gravity solidification method | Atomization method |
| Atmosphere            | Ar               | Ar  | Ar                 |
| Process parameter     | 30 m/s           | 1,250°C/s                                 |                    |
| heat treatment        | 24 hr @900°C     | 24 hr @900°C                              | 24 hr @900°C       |
| Atmosphere            | N <sub>2</sub>   | N <sub>2</sub>                            | N <sub>2</sub>     |

3. Parts of Materials A to C were subjected to analyses. TABLE II below shows the results.

TABLE II

| Material                    | A                                 | B                                 | C                                 |
|-----------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Shape                       | Ribbons and particles             | Particles                         | Particles                         |
| Average diameter            | > 10 µm                           | > 10 µm                           | > 10 µm                           |
| Composition of alloy matrix | PtFe                              | PtFe                              | PtFe                              |
| SEM observation             | Homogeneous with no FeN particles | Homogeneous with no FeN particles | Homogeneous with no FeN particles |
| Nitrogen content            | Cannot be confirmed               | Cannot be confirmed               | Cannot be confirmed               |

4. Fuel cells A to C were manufactured using remainders of Materials A to C. Then, performances of Fuel cells A to C were evaluated. As a result, it was revealed that each performance of Fuel cells A to C was too low to be measured.

5. The undersigned petitioner declares further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable fine or imprisonment, or both, under Section 1001 of Title 18 of the United State Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Wu Mei

January 16, 2009

Date